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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,211	11/26/2003	Dale A. Londre	03-0271	1210

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EXAMINER
VU, JIMMY T

ART UNIT	PAPER NUMBER
2821	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,211	LONDRE	
	Examiner	Art Unit	
	Jimmy T. Vu	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-11 and 15-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-18,42 and 43* is/are allowed.

6)☒ Claim(s) *1,8-10,19-21,23,24,26-30,32-39 and 41* is/are rejected.

7)☒ Claim(s) *3-7,11,22,25,31 and 40* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: see attached sheet of Fig. 2 in last page of Office Action.

DETAILED ACTION

The indicated allowability of claims 1, 3-11 and 15-43 is withdrawn in view of the newly discovered reference(s) to Sorbello (U.S. Patent 4,929,959), Phelan (U.S. Patent 6,842,157 B2), Collins (U.S. Patent 5,086,304) and Phelan (U.S. Patent 6,646,621). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9, 20, 23, 26, 29, 32, 34-39 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Sorbello (U.S. Patent 4,929,959).

Regarding claim 1, Sorbello discloses a subarray beamformer (layers 100-500) (Fig. 2) for a multi-beam phased array antenna [(Fig. 2) [refer to phase array antenna with 90° phase as in col. 2, lines 15-17) comprising: a plurality of phased array antenna beamforming layers (100-500) (Fig. 2) comprising; a first beamforming layer (200) (Fig. 2) having a first plurality of combiners (C1) [see attached sheet of Fig. 2] in a first orientation (1) [see attached sheet of Fig. 2] and combining a first set of signals [see attached sheet of Fig. 2] to form a second set of signals [see attached sheet of Fig. 2]; and a second beamforming layer (400) (Fig. 2) having a second plurality of combiners

(C2) [see attached sheet of Fig. 2] in a second orientation (2) [see attached sheet of Fig. 2] coupled to and opposing said first plurality of combiners [opposing by layer (300) (Fig. 2)] , said second plurality of combiners combining said second set of signals [see attached sheet of Fig. 2] to form at least one first combined signal,

wherein said first plurality of combiners are in a first unidirectional orientation (1) and said second plurality of combiners are in a second unidirectional orientation (2) orthogonal [the orientations of the first and second combiners (1) and (2) are orthogonal as shown in attached sheet of Fig. 2] to said first unidirectional orientation.

Regarding claims 9, 20, 26, 32, 36 and 38, Sorbello discloses the assembly wherein said subarray beamformer comprises fewer beamforming layers (5 layers) (Fig. 2) than a quantity of radiating elements [there are many elements/slots (16a) on radiating layer 300] (Fig. 2) within said plurality of radiating elements (col. 3, lines 38-40).

Regarding claims 23 and 35, Sorbello discloses an satellite (col. 1, line 41) having a multi-beam phased array antenna assembly (Fig. 2) comprising: a plurality of radiating elements [radiation elements of layer 300 (Fig. 2, col. 2, lines 55-56)] receiving a plurality of beams [beams transmit from layers (200) and (400)] having a first set of signals (at C1) [see attached sheet of Fig. 2]; a common structure (layer 300) coupled to said plurality of radiating elements (Fig. 2); a plurality of signal conditioners (radiating slots 16a) (Fig. 2) coupled to said common structure; and a subarray beamformer (layers 100-500) (Fig. 2) coupled to said plurality of signal conditioners and comprising; a plurality of phased array antenna beamforming layers (100-500) (Fig. 2) comprising; a

first beamforming layer (200) (Fig. 2) having a first plurality of combiners (C1) [see attached sheet of Fig. 2] in a first orientation (1) and combining said first set of signals to form a second set of signals [see attached sheet of Fig. 2]; and a second beamforming layer (400) (Fig. 2) having a second plurality of combiners (C2) [see attached sheet of Fig. 2] in a second orientation (2) coupled to and opposing said first plurality of combiners [opposing by layer (300) (Fig. 2)], said second plurality of combiners combining said second set of signals to form at least one first combined signal (Fig. 2 in attached sheet).

Regarding claims 28 and 34, Sorbello discloses an assembly wherein said plurality of phased array antenna beamforming layers comprise approximately two beamforming layers (Fig. 2).

Regarding claims 29 and 37, Sorbello discloses an satellite (col. 1, line 41) having a multi-beam phased array antenna assembly (Fig. 2) comprising: a plurality of radiating elements [radiation elements of layer 500 (Fig. 2, col. 2, lines 55-56)] transmitting a plurality of beams [beams transmit from layers (400) and (400)] having a first set of signals (at C1) [see attached sheet of Fig. 2]; a common structure (layer 300) coupled to said plurality of radiating elements (Fig. 2); a plurality of signal conditioners (radiating slots 16a) (Fig. 2) coupled to said common structure; and a subarray beamformer (layers 100-500) (Fig. 2) coupled to said plurality of signal conditioners and comprising; a plurality of phased array antenna beamforming layers (100-500) (Fig. 2) comprising; a second beamforming layer (400) (Fig. 2) having a second plurality of dividers (D2) [see attached sheet of Fig. 2] in a second orientation (4) [see attached

sheet of Fig. 2] and dividing at least one first combined signal (at C1) to form a second set of signals [see attached sheet of Fig. 2]; and a first beamforming layer (200) (Fig. 2) having a first plurality of dividers (D1) [see attached sheet of Fig. 2] in a first orientation (3) [see attached sheet of Fig. 2] coupled to and opposing said second plurality of dividers [opposing by layer (300) (Fig. 2)], said first plurality of dividers dividing said second set of signals to form at least one first set of signals (Fig. 2 in attached sheet).

Regarding claim 39, Sorbello discloses method of forming a multi-beam phased array antenna assembly (Fig. 2) comprising: manufacturing a common structure (300) (Fig .2) configured to couple a plurality of radiating elements [layer 300 is coupled with plurality of radiating elements] (Fig. 2) to a plurality of signal conditioners [radiating slots (16a) in Fig. 2]; coupling a beamforming board [layer 300 is also a beamforming board] to said plurality of signal conditioners; and encasing said plurality of signal conditioners and said beamforming board in said common structure (Fig. 2).

Regarding claim 41, Sorbello discloses a subarray beamformer (layers 100-500) (Fig. 2) for a multi-beam phased array antenna [(Fig. 2) [refer to phase array antenna with 90° phase as in col. 2, lines 15-17) comprising: a plurality of phased array antenna beamforming layers (100-500) (Fig. 2) comprising; a second beamforming layer (200) (Fig. 2) having a second plurality of dividers (D2) [see attached sheet of Fig. 2] in a first orientation (4) [see attached sheet of Fig. 2] and dividing at least one first combined signal [see attached sheet of Fig. 2] to form a second set of signals [see attached sheet of Fig. 2]; and a first beamforming layer (200) (Fig. 2) having a first plurality of dividers (D1) [see attached sheet of Fig. 2] in a first orientation (3) [see attached sheet of Fig. 2]

coupled to and opposing said first plurality of combiners [opposing by layer (300) (Fig. 2)] , said first plurality of dividers dividing said second set of signals [see attached sheet of Fig. 2] to form a first set of signals, wherein said first plurality of dividers are in a first unidirectional orientation (3) and said second plurality of dividers are in a second unidirectional orientation (4) orthogonal [the orientations of the first and second dividers (3) and (4) are orthogonal as shown in attached sheet of Fig. 2] to said first unidirectional orientation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorbello (U.S. Patent 4,929,959) in view of Phelan (U.S. Patent 6,842,157 B2).

Regarding claims 8 and 19, Corbello discloses all of the limitations except of a beamformer wherein the second beamforming layer comprises fewer combiners/dividers than the first beamformer layer. However, Phelan teaches the beamformer having a second layer (27) (Fig. 2) having fewer combiners/dividers (inside the layer) than a first layer (23) (Fig. 2) [layer 23 having more combiners/dividers (elements 24) than elements in layer 27]. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to set up the device

of Sorbello with two layers have different combiners/dividers as taught by Phelan in order to arrange the coupling of layers into antenna system for controlling the phase or bandwidth of frequency.

5. Claims 10, 21, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorbello (U.S. Patent 4,929,959) in view of Collins (U.S. Patent 5,086,304).

Regarding claims 10, 21, 27 and 33, Sorbello discloses all of the limitations except the plurality of phased array antenna beamforming layers comprise approximately less than or equal to four beamforming layers. However, Collins teaches the phased array antenna comprises four beamforming layers in Fig. 2, col. 6, lines 55. Therefore, it would have obvious to one having skill in the art at the time of the invention was made to provide the phased array antenna system of Sorbello with the four beamforming layers as taught by Collins in order to incorporate the antenna a novel waveguide network to improve the reception and transmission of high frequency signals.

6. Claims 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorbello (U.S. Patent 4,929,959) in view of Phelan (U.S. Patent 6,646,621).

Regarding claim 24 and 30, Sorbello discloses all of the limitations except of comprising a cover coupled to the subarray beamformer. However, as evidenced by Phelan, providing a cover (40) (Fig. 7) is well known in the art. Therefore, it would have

been obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna device of Sorbello with the cover as taught by Phelan in order to prevent the damage that may occurred to the antenna and improve the transmission and reflection of the surface during the operation of radiation.

Allowable Subject Matter

7. Claims 15-18, 42 and 43 are allowed.

8. Claims 3, 4, 7, 11, 22, 25, 31 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy T Vu whose telephone number is (571) 272-1832. The examiner can normally be reached on M - F: 9 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.

Jimmy Vu

March 16, 2007

Dwight W. Owens 3/19/07

DOUGLAS W. OWENS
SUPERVISORY PATENT EXAMINER

FIG.1a

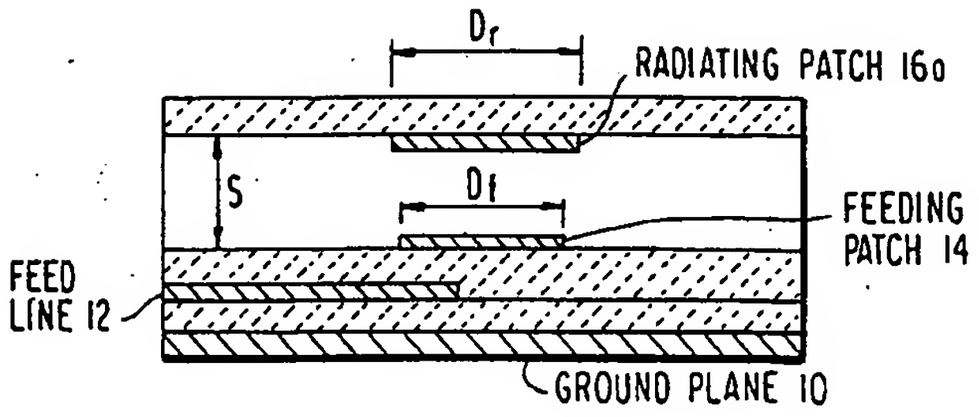

FIG.1b

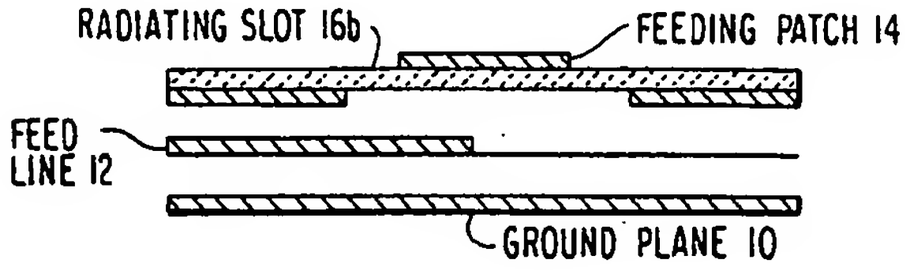

FIG.1c

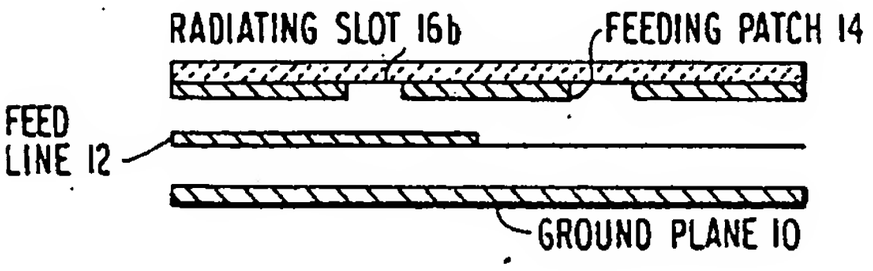

FIG.2